PATENT
32860-001044/US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPELLANTS:	Sebastian Budz et al.	CONF. NO.:	4363
APPL'N NO.:	10/580,687	GROUP:	2624
FILED:	May 26, 2006	EXAMINER:	Nancy Bitar
FOR:	METHOD OF NAVIGATION IN THREE-DIMENSIONAL IMAGE DATA		

APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. § 41.37

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Date: June 7, 2010

Sir/Madam:

In accordance with the provisions of 37 C.F.R. § 41.37, Appellants submit the following:

I. REAL PARTY IN INTEREST.

The real party in interest is Siemens Aktiengesellschaft.

II. RELATED APPEALS AND INTERFERENCES.

No related appeals or interferences are known.

III. STATUS OF CLAIMS.

Claims 1-19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over by Gering et al., *A System for Surgical Planning and Guidance using Image Fusion and Interventional MR*, hereinafter "Gering,"[1] in view of Golland et al., *Anatomy Browser: A Novel Approach to Visualization and Integration of Medical Information*, hereinafter "Golland."[2] (Final Office Action for U.S. Appl. No. 10/580,687, p. 3, December 9, 2009).

Claims 1-19 are being appealed.

IV. STATUS OF AMENDMENTS.

The Amendment filed on September 1, 2009 has been entered and considered by the Examiner (Final Office Action for U.S. Appl. No. 10/580,687, December 9, 2009).

V. SUMMARY OF CLAIMED SUBJECT MATTER.

A. CONCISE EXPLANATION OF THE SUBJECT MATTER SET FORTH IN EACH INDEPENDENT CLAIM ARGUED SEPARATELY.

1. A general discussion of the subject matter described in the specification to assist the Board in understanding example embodiments described in the present application.

Conventionally, three-dimensional image data of a same body from different imaging methods can be brought together in a common display in a process called fusion. Data from hot spots permit image data from one imaging

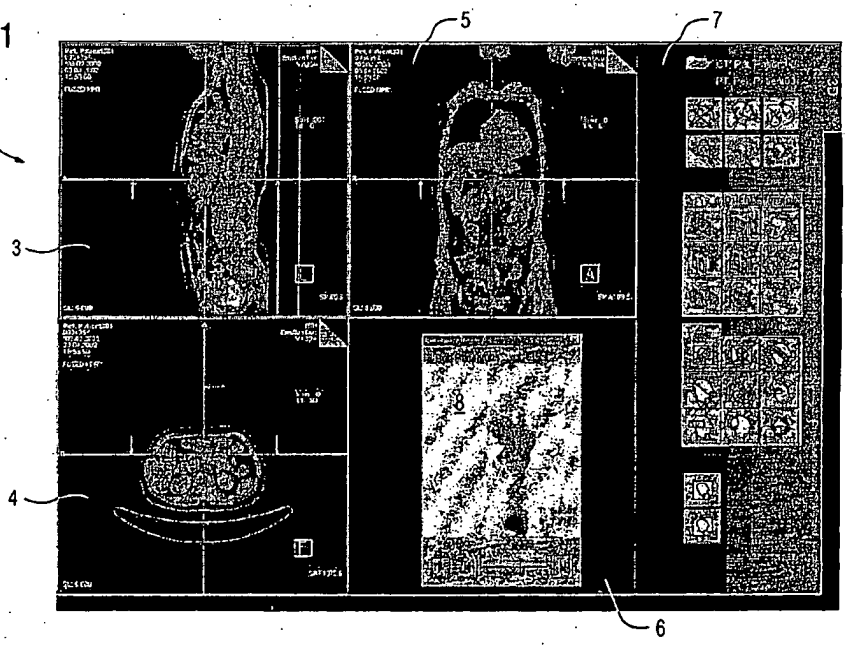
[1] Gering et al., "A system for Surgical Planning and Guidance using Image Fusion and Interventional MR", Thesis at the Massachusetts Institute of Technology, December 1999, XP 002293852, pp. 26-42.
[2] Golland et al., "Anatomy Browser: A Novel Approach to Visualization and Integration of Medical Information", Computer Assisted Surgery, Vol. 4: 129-143, 1999, XP 002280194.

method to be viewed in the context of image data of another imaging method. Hot spots may refer to image regions of increased intensity that indicate the presence of a tumor in the region.

However, in the conventional methods, the viewer may not have immediate access to depth information and consequently, may have trouble navigating the image data.

FIG. 1 illustrates a screenshot of a medical image processing workstation having two-dimensional projections of a three-dimensional image data record. A computed tomography (CT) image data record is shown that was obtained by fusion with a positron emission tomography (PET) image data record.

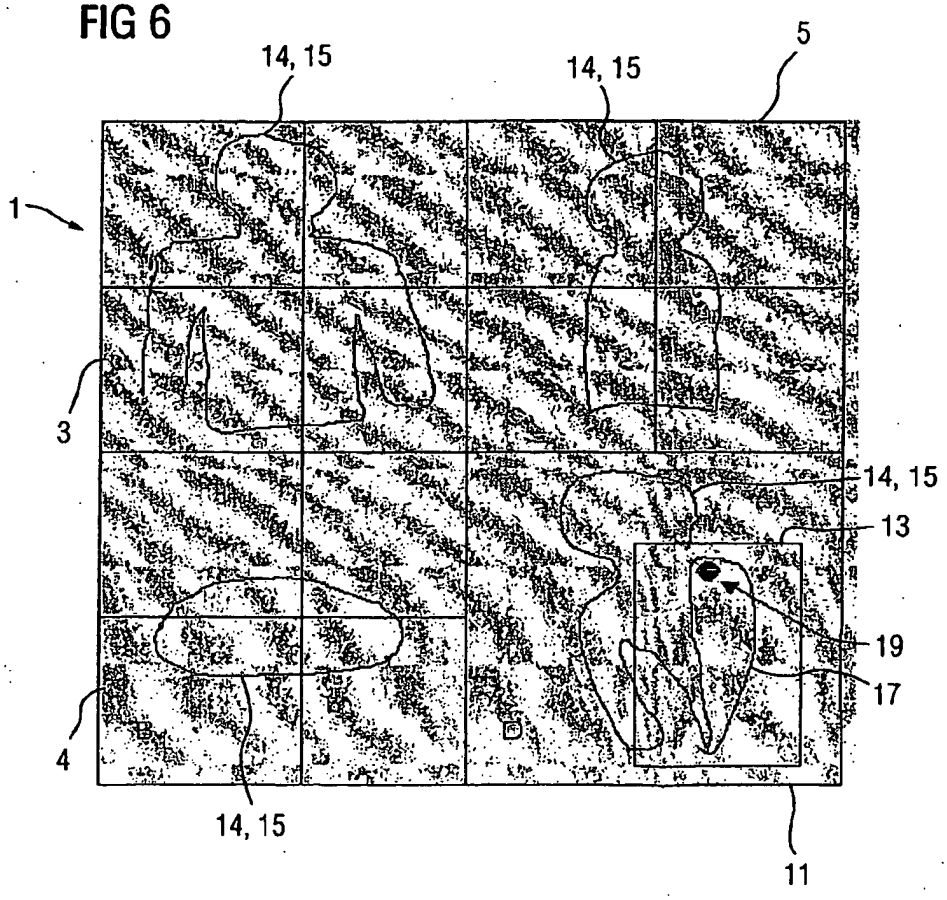
FIG 1



The display shows a screenshot 1 having four viewports 3-6, showing different slice planes or slice layers. Using these different projections, a user can display partial image data records or hot spots and determine their three-dimensional position.

FIG. 6 illustrates a screen view 1 with four viewports 3-5 and 11.

FIG 6



The viewport 11 illustrates a slice plane 13 through a fused image data record that includes a projection of CT data record 14 and PET data record 15. The viewport 11 shows a functionalized projection that allows a user to select hot spots 19 in a slice plane 13. The hot spots 19 within the PET data record 15 are emphasized, for example, by a different color.

The viewports 3-5 show the fused data record in selected slice planes that do not include the hot spots 19.

To view the hot spots 19 in the viewports 3-5, the viewport 11 is rotated and the slice plane 13 is displaced to focus on the hot spot 19. Three-

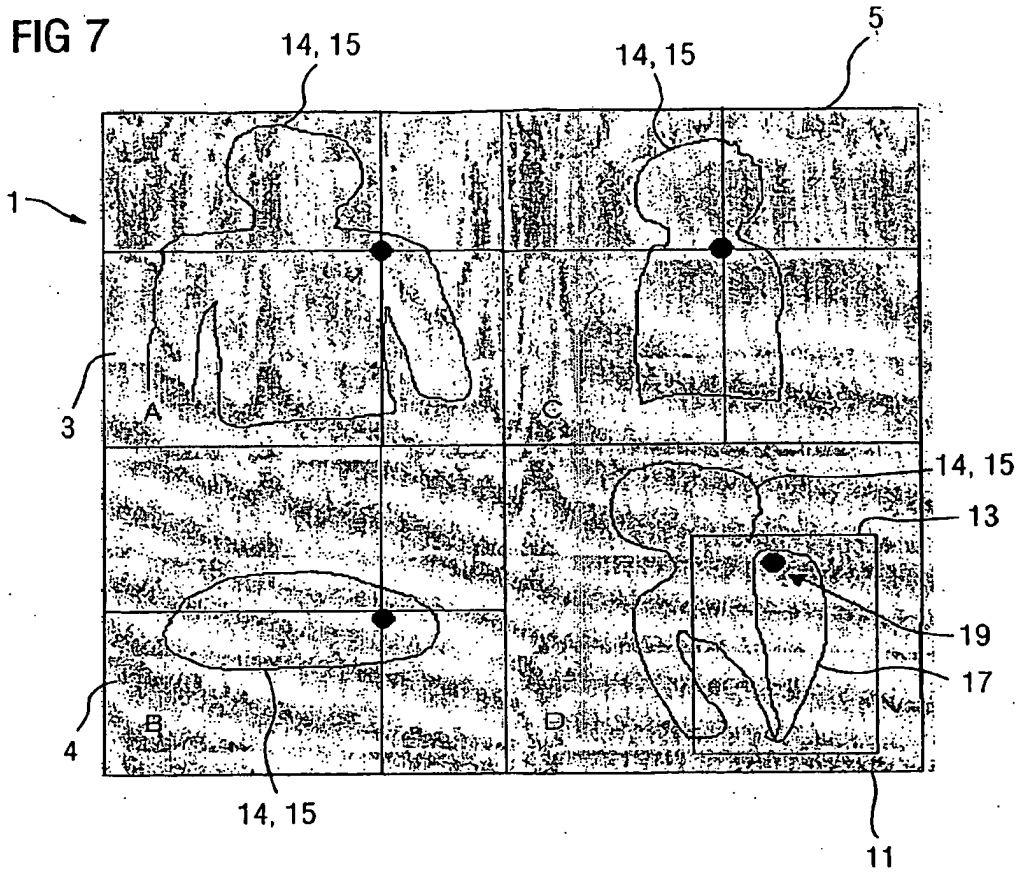
dimensional depth information is provided indirectly and enables the hot spot 19 to be selected with a mouse click ("volume-picking").

The slice plane 13 or the centroid of the slab in the viewport 11 is displaced in the fusion display onto the selected hot spot 19. The images in the viewports 3-5 are likewise displaced onto the hot spot 19.

Consequently, a screen view 1 for identifying a hot spot 19 is automatically produced for the user without the need to manually set projections suitable in terms of rotation angle and depth in the viewports 3-5. Consequently, the hot spot 19 can be sought in the viewport 11 and then produced in the viewports 3-5.

FIG. 7 illustrates the screen view 1 obtained as a result of volume picking with regard to the hot spot 19.

FIG 7



2. An explanation of the subject matter set forth in each independent claim argued separately referring to the specification and/or the drawings by reference characters in accordance with 37 C.F.R. § 41.37(c)(1)(v).

Claim 1 is directed to a method for navigating in three-dimensional electronic data records (e.g., CT and PET). The image data records may include three-dimensional partial data records (*See, e.g.*, Sub. Spec. at ¶¶ 27 and 31).

The method includes optically displaying at least two mutually perpendicular two-dimensional projections of an image data record (e.g., viewports 3-5 and 11 in FIG. 6). At least one of the two projections includes at least one two-dimensional partial projection of at least one partial image data record (e.g., slice plane 13 in FIG. 6).

The at least one two-dimensional partial projection is optically emphasized and then functionalized such that the at least one optically emphasized partial projection is selectable by a user input (e.g., hot spot 19 in FIG. 6) (*See, generally,* Sub. Spec. at ¶¶ 32-33).

The method further includes displacing the at least one projection not including the at least one partial projection in such a way that it includes the partial projection (e.g., viewports 3-5 in FIG. 7) (*See, e.g.*, Sub. Spec. at ¶¶ 33-35).

Claim 16 is directed to an apparatus for navigating in three-dimensional electronic data records (e.g., CT and PET). The image data records may include three-dimensional partial data records (*See, e.g.*, Sub. Spec. at ¶¶ 27 and 31).

The apparatus includes a means for optically displaying at least two mutually perpendicular two-dimensional projections of an image data record (e.g.,

viewports 3-5 and 11 in FIG. 6) (*See, e.g.*, Sub Spec. at ¶¶ 38-39). At least one of the two projections includes at least one two-dimensional partial projection of at least one partial image data record (e.g., slice plane 13 in FIG. 6).

The apparatus further includes a means for optically emphasizing at least one two-dimensional partial projection and a means for functionalizing the at least one optically emphasized partial projection such that the at least one optically emphasized partial projection is selectable by a user input (e.g., hot spot 19 in FIG. 6) (*See, generally*, Sub. Spec. at ¶¶ 32-33 and 38-39).

The apparatus also includes a means for receiving user input directed toward the selection of the at least one functionalized partial projection and a means for automatically displacing the at least one projection not including the at least one partial projection in such a way that it includes the partial projection after displacement (e.g., viewports 3-5 in FIG. 7) (*See, e.g.*, Sub. Spec. at ¶¶ 33-35 and 38-39).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL.

Appellants seek the Board's review of the rejection of claims 1-19 under 35 U.S.C. § 103(a) as being unpatentable over by Gering et al., *A System for Surgical Planning and Guidance using Image Fusion and Interventional MR*, hereinafter "Gering," in view of Golland et al., *Anatomy Browser: A Novel Approach to Visualization and Integration of Medical Information*, hereinafter "Golland," as set forth on page 3 of the December 9, 2009 Final Office Action.

Claims 1-19 are being appealed.

Claims 1-15 rise and fall together.

Claims 16-19 rise and fall together.

VII. ARGUMENT.

A. Rejection of claims 1-19 as allegedly being unpatentable over Gering in view of Golland.

Appellants request that the Board reverse the Examiner's rejection of claims 1-19 under 35 U.S.C. § 103(a) as being unpatentable over Gering in view of Golland.

Principals of Law

The Examiner bears the initial burden of presenting a prima facie case of obviousness in rejecting claims under 35 U.S.C. § 103. *See In re Rijckaert*, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993).

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073, 5 USPQ2d 1956, 1958 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), *viz.*, (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; and (3) the level of ordinary skill in the art. "[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability." *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

Furthermore, "'there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness'...[H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the would employ." *KSR Int'l Co. v. Telefax Inc.*, 127 S.Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006)).

Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. *See Oetiker*, 977 F. 2d at 1445, 24 USPQ2d at 1444.

Generally, each element of the claim must be known in the prior art for the claim to be obvious. *See generally, KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 415-16, 82 USPQ2d 1385, 1395.

Analysis

On page 3 of the Final Office Action mailed December 9, 2009, the Examiner rejects claims 1-19 under 35 U.S.C. § 103(a) as being unpatentable over Gering in view of Golland. Appellants request that the Board withdraw the rejection of claims 1-19.

A. THE GERING REFERENCE

Gering discloses a surgical assistant using image fusion. Figure 2-5 of Gering, which is provided below for the Board's convenience, describes blending techniques that are used.

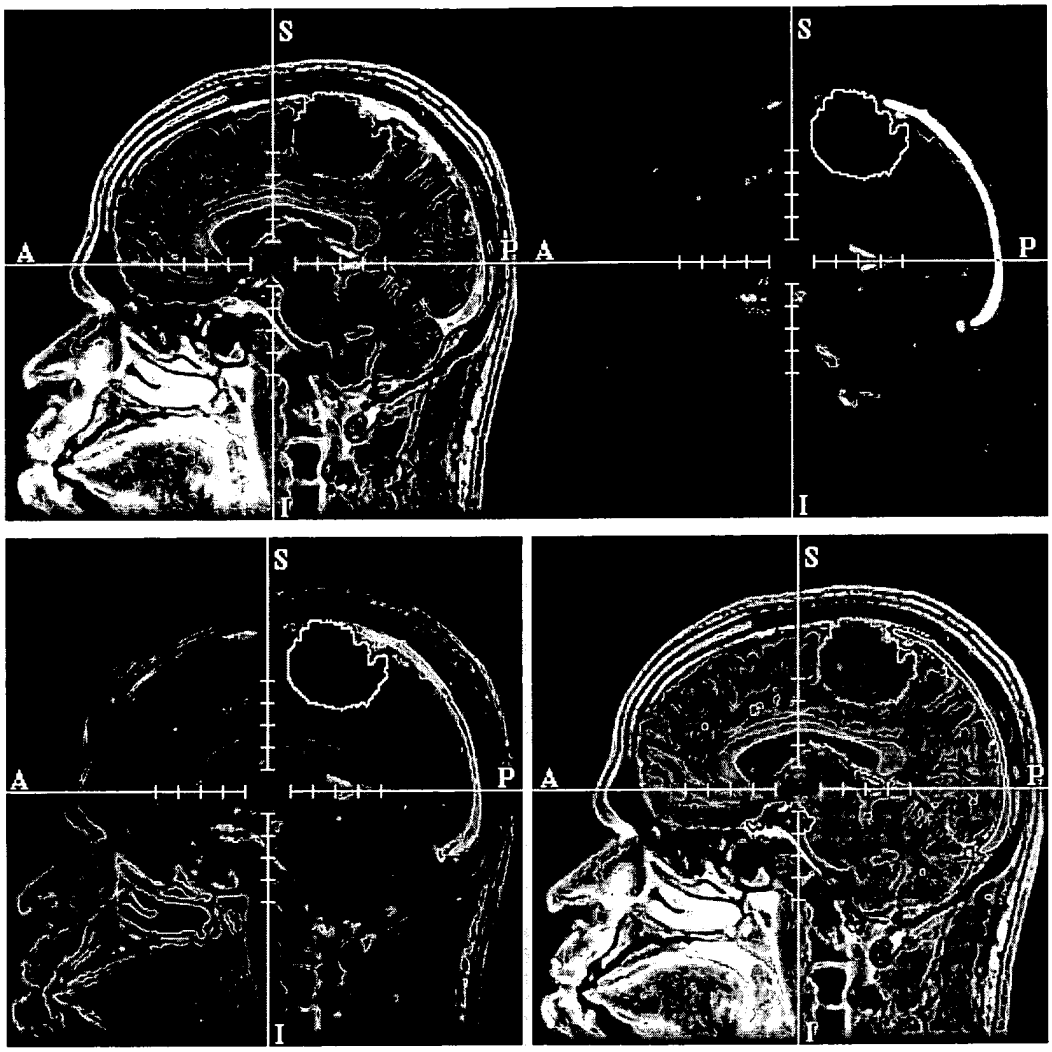


Figure 2-5.

An outline of a tumor segmentation is shown (in the S and P quadrant) in each of the four images of Figure 2-5. A user may click on a center of the tumor to magnify the tumor, as shown in Figure 2-7 below.

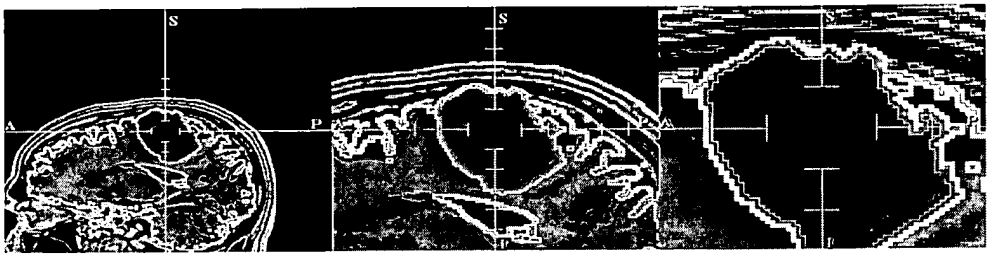


Figure 2-7

B. THE GOLLAND REFERENCE

Golland discloses an anatomy browser which provides cross-referencing among types of displays. "If a user clicks on one of the display areas (<*Shift-Click*>), a cross-hair appears on all four displays at locations corresponding to the same 3D point." (*See*, 4.2 of Golland). Thus, if an input is made for a first display, the other displays are not changed.

C. GOLLAND IN VIEW OF GERING FAILS TO DISCLOSE OR SUGGEST THE "DISPLACING, AS A FUNCTION OF THE USER INPUT" OF CLAIM 1.

Claim 1 requires, *inter alia*, "automatically displacing ... the at least one projection not including the at least one partial projection in such a way that it includes the partial projection." (emphasis added). At least this feature is not disclosed or suggested by Gering, Golland or a combination of the two (assuming they could be properly combined, which Appellants do not admit).

On page 2 of the Office Action dated December 9, 2009; the Examiner relies on Gering to teach the emphasized portion of claim 1 above.[3] The Examiner

[3] The Examiner "first refers to (page 37, paragraph: Reformatted slice location) of Gering et al that teaches that the users may simply click on a location to change the center of all slices (the focal point) to that point in 3D space. Moreover, Gering figures 2-7 shows shot

clarified during the interview of February 23, 2010 that she is interpreting the "at least one projection not including the at least one partial projection" as the images having an outline of a tumor, as shown in Figure 2-5 of Gering. Moreover, the Examiner provided that Gering discloses magnifying the tumor (Figure 2-7), thereby eliminating the majority of any one of the images shown in Figure 2-5. By magnifying the selected tumor, the Examiner believes that Gering teaches "automatically displacing, as a function of the user input, the at least one projection not including the at least one partial projection in such a way that it includes the partial projection."

However, claim 1 requires displacing a segmentation "not including the at least one partial projection in such a way that it includes the partial projection." Figure 2-5 illustrates an outline of a tumor. Moreover, Figure 2-7 illustrates a magnified version of the same tumor. Consequently, using the Examiner's logic, Figure 2-5 illustrates a projection with a partial projection because Figure 2-5 shows the tumor. Thus, Figure 2-5 fails to illustrate a projection not including a partial projection. Therefore, the magnifying in Gering does not displace a projection not including a partial projection.

Even if Golland could be properly combined with Gering (which Appellants do not admit), Golland fails to cure the deficiencies of Gering as described above. Therefore, Gering and Golland fail to render claim 1 obvious. Claims 2-15 are patentable at least by virtue of the dependence on claim 1.

Claim 16 is a separate independent claim from claim 1, wherein each independent claim contains its own individual limitations. Claim 16 should be

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taken after clicking on the center of the tumor thus all slices were set to have sagittal orientations and different zoom factors."

interpreted solely based upon limitations set forth therein. However, claim 16 is patentable for at least reasons somewhat similar to those set forth above regarding claim 1. Claims 17-19, which are dependent on claim 16, are patentable for at least the reasons set forth above.

VIII. CLAIMS APPENDIX.

An appendix containing a copy of the claims involved in the appeal is attached.

IX. EVIDENCE APPENDIX.

An appendix containing copies of any evidence submitted pursuant to §§ **1.130**, **1.131**, or **1.132** of this title or of any other evidence entered by the examiner and relied upon by appellant in the appeal, along with a statement setting forth where in the record that evidence was entered in the record by the Examiner is attached.

X. RELATED PROCEEDINGS APPENDIX.

An appendix containing copies of decisions rendered by a court or the Board in any proceeding identified pursuant to paragraph (c)(1)(ii) of this section is attached.

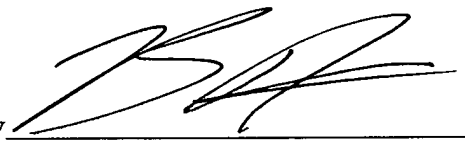
CONCLUSION

In light of the foregoing arguments, Appellants respectfully request the Board to reverse the Examiner's rejection of claims 1-19.

The Commissioner is authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

HARNESS, DICKEY & PIERCE, PLC

By 

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VIII. CLAIMS APPENDIX.

Claims on Appeal:

1. A method for navigating in three-dimensional electronic image data records, the image data records including three-dimensional partial image data records, the method comprising:

optically displaying at least two mutually perpendicular two-dimensional projections of an image data record, at least one of the two projections including at least one two-dimensional partial projection of at least one partial image data record;

optically emphasizing the at least one two-dimensional partial projection;

functionalizing the at least one optically emphasized partial projection such that the at least one optically emphasized partial projection is selectable by a user input;

receiving a user input directed toward the selection of the at least one functionalized partial projection; and

automatically displacing, as a function of the user input, the at least one projection not including the at least one partial projection in such a way that it includes the partial projection.

2. The method as claimed in claim 1, wherein the image data record is formed by fusing at least two source image data records.

3. The method as claimed in claim 2, wherein all the partial image data records are formed from the same source image data record.

4. The method as claimed in claim 2, wherein the source image data records includes a source image data record obtained from a computed tomography method, and a source image data record obtained from a positron emission tomography method.

5. A computer readable medium storing a computer program that facilitates at least one of executing and installing the method as claimed in claim 1 on a computer.

6. The method as claimed in claim 3, wherein the source image data records includes a source image.

7. A computer readable medium storing a computer program that facilitates at least one of executing and installing the method as claimed in claim 2 on a computer.

8. A computer readable medium storing a computer program that facilitates at least one of executing and installing the method as claimed in claim 3 on a computer.

9. A computer readable medium storing a computer program that facilitates at least one of executing and installing the method as claimed in claim 4 on a computer.

10. A computer readable medium storing a computer program that facilitates at least one of executing and installing the method as claimed in claim 6 on a computer.

11. A computer readable medium including program segments for, when executed on a computer, causing the computer to implement the method of claim 1.

12. A computer readable medium including program segments for, when executed on a computer, causing the computer to implement the method of claim 2.

13. A computer readable medium including program segments for, when executed on a computer, causing the computer to implement the method of claim 3.

14. A computer readable medium including program segments for, when executed on a computer, causing the computer to implement the method of claim 4.

15. A computer readable medium including program segments for, when executed on a computer, causing the computer to implement the method of claim 6.

16. An apparatus for navigating in three-dimensional electronic image data records, the image data records including three-dimensional partial image data records, the apparatus comprising:

means for optically displaying at least two mutually perpendicular two-dimensional projections of an image data record, at least one of the two projections including at least one two-dimensional partial projection of at least one partial image data record;

means for optically emphasizing the at least one two-dimensional partial projection;

means for functionalizing the at least one optically emphasized partial projection such that the at least one optically emphasized partial projection is selectable by a user input;

means for receiving a user input directed toward the selection of the at least one functionalized partial projection; and

means for automatically displacing, as a function of the user input, the at least one projection not including the at least one partial projection in such a way that it includes the partial projection after displacement.

17. The apparatus as claimed in claim 16, wherein the image data record is formed by fusing at least two source image data records.

18. The apparatus as claimed in claim 17, wherein all the partial image data records are formed from the same source image data record.

19. The apparatus as claimed in claim 17, wherein the source image data records includes a source image data record obtained from a computed tomography method, and a source image data record obtained from a positron emission tomography method.

IX. EVIDENCE APPENDIX.

None.

X. RELATED PROCEEDINGS APPENDIX.

None.